January 11, 1883.

THE PRESIDENT in the Chair.

The Presents received were laid on the table, and thanks ordered for them.

The following Papers were read:—

I. "Experiments, by the Method of Lorentz, for the further Determination of the Absolute Value of the British Association Unit of Resistance, with an Appendix on the Determination of the Pitch of a Standard Tuning-Fork." By Lord RAYLEIGH, F.R.S., Professor of Experimental Physics in the University of Cambridge, and Mrs. H. SIDGWICK. Received December 8, 1882.

(Abstract.)

The experiments described in the present paper were carried out during the spring and summer months of the present year, at the Cavendish Laboratory, and are divided into three distinct series. In the first and second series, the induction coils were situated nearly in the plane of the revolving disk, as in Lorentz's original use of the method; the difference between the two series relating only to the speed of rotation, which was varied in the proportion of 10 : 16. The third series presents a point of novelty, in that the induction coils were separated from the disk to such a distance as to render the accuracy of the result practically independent of the mean radius of the coils.

The small resistance, traversed by the battery current, to which the terminals of the galvanometer branch are connected, was obtained indirectly by a method of shunting. Thus in the first series, the principal part of the battery current passed on one side through two unit coils, placed in multiple arc, and equivalent to $\frac{1}{2}$, and only a comparatively small remainder through a second branch, composed of two coils in series, of values 10 and $\frac{1}{10}$. The terminals of the galvanometer branch were connected with the extremities of the $\frac{1}{10}$, and the difference of potentials between them, due to the primary current, was thus reduced to that which would be required to drive the current through a resistance of $\frac{1}{200}$.

From the first series—

$$1 \text{ B.A. unit} = \cdot 98674 \times 10^9 \text{ C.G.S.}$$

From the second series—

$$1 \text{ B.A. unit} = \cdot 98669 \times 10^9 \text{ C.G.S.}$$

From the third series—

$$1 \text{ B.A. unit} = \cdot 98683 \times 10^9 \text{ C.G.S.}$$

As a mean we take—

$$1 \text{ B.A. unit} = \cdot 986\frac{7}{8} \times 10^9 \text{ C.G.S.}$$

With use of the ratio between the mercury unit and the B.A. unit, found by us ("Proc. Roy. Soc." May, 1882) this gives—

$$1 \text{ mercury unit} = \cdot 94150 \times 10^9 \text{ C.G.S.},$$

or, which is the same thing, the ohm is the resistance of a column of mercury at 0° Cent., whose section is one square millimetre, and whose length is—

1062·14 millimetres.

The very close accordance between the result of the present investigation, and that obtained by the method of the revolving coil (·98651), and by Glazebrook (·98665), using another method again, leads us to hope that no error of importance can have escaped detection.

The Appendix is devoted to a record of experiments having for object the determination of the absolute pitch of a certain tuning-fork, which has served as the standard of time throughout all our work upon this subject. It is believed that the method employed is worthy of attention, and may be useful to other physicists.

II. "On the Skeleton of the Marsipobranch Fishes. Part I. The Myxinoids. (*Myxine* and *Bdellostoma.*) By W. K. Parker, F.R.S. Received December 14, 1882.

(Abstract.)

At present nothing is known of the development of these remarkable fishes, but their structure in the adult state is of great interest, and as the other related type—the Lamprey—has had great attention given to it lately, in most of its stages, I have thought it would be profitable to anatomists to have a detailed account of the skeleton in these lower and less known types. I received several specimens of the adult Hag-fish (*Myxine*) from my friends the late Professor Rolleston, F.R.S., and Mr. Frank Buckland; for fine specimens of the gigantic type (*Bdellostoma*) I am indebted to Professor Ray Lankester, F.R.S.

My guide in this work has been the excellent and most accurate Johannes Müller—his four memoirs (well known to anatomists) on